Remarks

Allowance of the pending claims is respectfully requested. Claims 1-24 remain pending.

In accordance with 37 C.F.R. 1.121(c)(1)(ii), a marked-up version of the amended claims is provided on one or more pages separate from the amendment. These pages are appended to the end of this Response.

No new matter is believed added to the application by the amendment presented herewith. The amendments to independent claims 1, 2 & 3 are supported by the protocol discussions presented throughout the application as filed.

In the Office Action, claims 1-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Badovinatz et al. (U.S. Patent No. 5,805,786) in view of Tsukerman et al. (U.S. Patent No. 6,341,340), and further in view of Cotner et al. (U.S. Patent No. 5,884,327). This rejection is respectfully traversed, to any extent deemed applicable to the claims presented herewith, and its reconsideration is requested.

An "obviousness" determination requires an evaluation of whether the prior art taken as a whole would suggest a claimed invention taken as a whole to one of ordinary skill in the art. In evaluating claimed subject matter as a whole, the federal circuit is expressly mandated that functional claim language be considered in evaluating the claim relative to the prior art. Applicants respectfully submit that the application of these standards to the

independent claims presented herewith leads to the conclusion that the recited subject matter would not have been obvious to one of ordinary skill in the art based upon the applied patents.

As recited in amended claim 1, for example, applicants' invention comprises a technique for recovery from failures within a shared nothing distributed computing environment. The technique includes detecting a failure within the shared nothing distributed computing environment. The shared nothing distributed computing environment is a transaction based environment, and the technique further includes automatically recovering from the failure. One or more transactions effected by the failure are recited to be automatically executed to completion notwithstanding the failure. This automatic execution occurs without rolling back the one or more transactions and without requiring a reposting of the one or more transactions.

With respect to the rejection, applicants respectfully traverse the combination proposed in the Office Action. Absent from the Office Action is any express teaching, suggestion or incentive identified in the art for making the proposed combination. The only justification for the combination of the patents is that they allegedly teach the benefit of (1) failure detection and recovery within a shared nothing distributed computing environment (Badovinatz et al. combined with Tsukerman et al.) and (2) the combination would speed up the processing of failure detection and recovery within a distributed system (modified Badovinatz et al. further modified by Cotner et al.). Applicants respectfully submit that these justifications do

not identify an adequate teaching, suggestion or incentive in the art itself for the modifications proposed in the Office Action.

Further, the Office Action provides no indication of how the various systems of the three patents would be modified when merged into the basic teaching of Badovinatz et al. in order to arrive at applicants' claimed invention. Both the suggestion and expectation of success for the modifications proposed in the Office Action must be found in the prior art. In this case, the basis for the combination is believed drawn from applicants' own disclosure. Applicants' above summarized technique comprises an approach for recovery from failures within a shared nothing distributed computing environment. Within this computing environment, one or more transactions effected by a failure are automatically executed to completion. The protocol necessary to accomplish this recovery and automatic execution of transactions would not be readily apparent to one skilled in the art given the shared nothing distributed nature of the environment.

Moreover, neither Badovinatz et al. or Tsukerman et al. are transaction based environments, let alone transaction based systems within a shared nothing distributed computing environment. Applicants respectfully submit that the problem of sharing transactions in a shared nothing system given a failure, wherein one or more of the transactions is effected by the failure, is a complicated problem statement not readily apparent to one skilled in the art from a reading of Badovinatz et al. combined with Tsukerman et al.

Badovinatz et al. address recovery of a name server managing membership of a domain of processors in a distributed computing environment. There is no teaching, suggestion or implication in Badovinatz et al. of a transaction based environment as recited by applicants. Further, Tsukerman et al. describe a method of group management wherein a database is divided among server with each server being responsible for a portion of the database. Again, since this is a non-transaction based environment, applicants respectfully traverse the application of this patent, as well as Badovinatz et al. to the claims presented herewith.

Even assuming, arguendo, that the combination of Badovinatz et al., Tsukerman et al., and Cotner et al. is proper, the combination still fails to teach or suggest features of the recited invention. For example, each independent claim now recites a technique wherein there is automatic recovery from a failure. This is believed to be more than a straight forward extension of the teachings of the art in that automating transaction recovery within a shared nothing distributed computing environment requires significant protocol given the nature of the environment. The automatic recovery is further recited in each claim to comprise automatically executing one or more transactions effected by the failure to completion without rolling back the one or more transactions and without requiring a reposting of the one or more transactions. As recognized in the Office Action, neither Badovinatz et al. nor Tsukerman et al., describe execution of transactions to completion without rolling back one or more transactions and without requiring a reposting of the one or more transactions. For

a teaching of this concept, the Office Action relies on Cotner et al.

As expressly indicated in the Office Action, Cotner et al. discloses a database administrator being given a way to manually determine the outcome of a transaction to commit or roll back the transaction. Because Cotner et al. uses manual intervention to achieve a recovery, applicants respectfully submit that the combination of Badovinatz et al., Tsukerman et al., and Cotner et al., fails to teach, suggest or imply their invention as recited in the claims presented herewith. A whole new protocol is being added by the present invention to accomplish automatic recovery and automatic execution of one or more transactions effected by a failure. This automatic execution is recited to be accomplished without rolling back the transactions and without requiring reposting of the one or more transactions. No similar functionality is provided in Cotner et al., or the other known patents. Provisions for automatic recovery of transactions within a shared nothing distributed computing environment is believed to comprise a non-obvious extension of any teaching, suggestion or implication provided in the known art. The manual determination in Cotner et al. is not readily extendable by one skilled in the art to an automatic recovery process wherein one or more transactions effected by the failure are automatically executed to completion without rolling back the one or more transactions and without requiring reposting of the one or more transactions. This is evidenced, in part, by the extensive disclosure provided in the present application needed to teach and accomplish this automatic recovery function.

For all the above reasons, applicants respectfully request withdrawal of the rejection to independent claims 1, 2 & 3.

The dependent claims are believed allowable for the same reasons as the independent claims, as well as for their own additional characterizations. In this regard, applicants respectfully traverse, for example, the rejections to claims 5, 6, 12, 13, 19 & 20, since neither Badovinatz et al. nor Tsukerman et al. present a transaction based environment. Lacking such an environment, applicants respectfully traverse any conclusion that the recited recovering comprising synchronizing messages regarding one or more of the transactions among surviving members of a processing group, and further performing a commit process for the one or more transactions would have been straight forward to one skilled in the art.

In view of the above amendments and remarks, applicants respectfully request allowance of all claims pending herein. Applicants' undersigned attorney is available should any remaining issue require resolution.

Respectfully submitted,

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Version with markings to show changes made

In the Claims:

Please amend claims 1, 2 & 3 as set forth below:

1. (AMENDED) A method of recovery from failures within a shared nothing distributed computing environment, said method comprising:

detecting a failure within said shared nothing distributed computing environment; and

automatically recovering from said failure, wherein one or more transactions affected by said failure are automatically executed to completion without rolling back said one or more transactions and without requiring a reposting of said one or more transactions.

2. (AMENDED) A system of recovery from failures within a shared nothing distributed computing environment, said system comprising:

means for detecting a failure within said shared nothing distributed computing environment; and

means for automatically recovering from said failure, wherein one or more transactions affected by said failure are automatically executed to completion without rolling back said one or more transactions and

without requiring a reposting of said one or more transactions.

3. (AMENDED) At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of recovery from failures within a shared nothing distributed computing environment, said method comprising:

detecting a failure within said shared nothing distributed computing environment; and

automatically recovering from said failure, wherein one or more transactions affected by said failure are automatically executed to completion without rolling back said one or more transactions and without requiring a reposting of said one or more transactions.